Introduction to CORESTA
Work Related to Premium Cigars

Committee on Health Effects and Patterns of Use of Premium Cigars

23rd of April 2021

Agenda

- **Introduction to CORESTA**
- **Relevant Sub Groups under the Product Technology Study Group**
  - TTPA (Tobacco and Tobacco Product Analysis)
  - CSM (Cigar Smoking Methods)
  - Summary of relevant methodologies
- **Research published at CORESTA conferences**
- **Summary**
- **Questions**

STATUTES & RULES ARE PUBLICLY AVAILABLE

CORESTA

Cooperation Centre for Scientific Research Relative to Tobacco

A non-profit organisation created in 1956 governed by French law

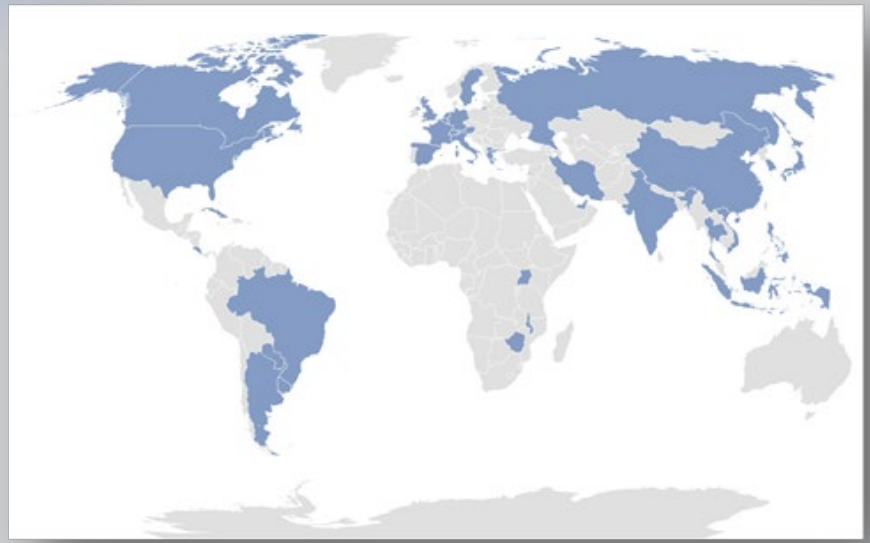
Purpose

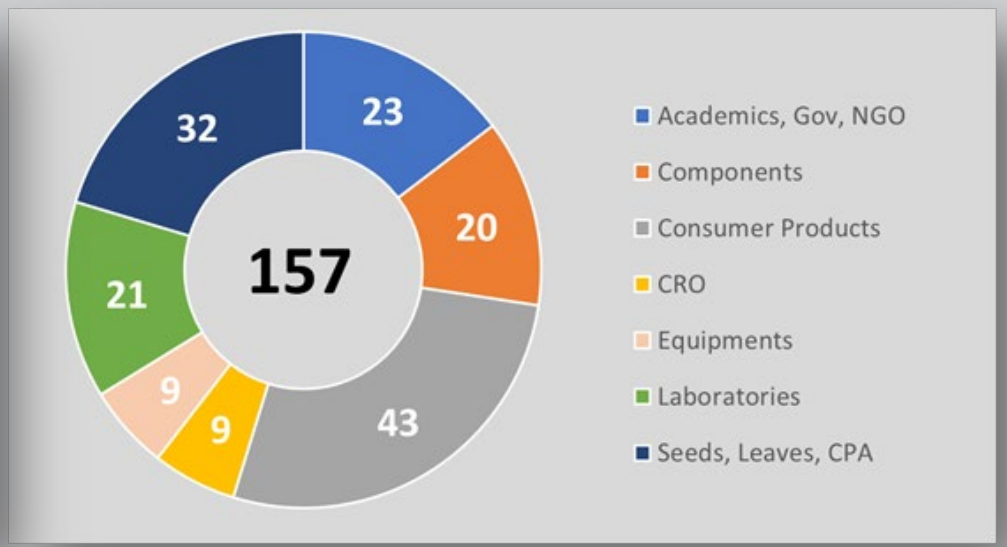
To promote cooperation in scientific research relative to tobacco and its derived products

www.coresta.org

Membership

157 organisation members from 36 countries (February 2021)





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CORESTA Cooperation

- **Since 1972** Agrochemicals Analysis
- **1993** Pest and Sanitation Management in Stored Tobacco
- **2004** Proficiency Testing for Detection of Transgenic Tobacco
- **2006** TSNA in Air-cured and Fire-cured Tobacco
- **2012** Agrochemical Residue Field Trials
- **2019** Collaborative Study of Low Nicotine Tobacco Agronomic Production Practices

Agronomy & Leaf Integrity

Phytopathology & Genetics

- **2005** Integrated Pest Management
- **2013** Extended Diagnostic Expert System
- **2015** Efficacy of Biological & Eco-Friendly Crop Protection Agents
- **2015** Collaborative Study Black Shank
- **2017** Tobacco Alkaloid Genetics
- **2017** Tobacco Biotechnology and Omics
- **2021** *Nicotiana* Germplasm Collection

~ 600 experts cooperating in 25 working groups

- **1996 Product Use Behaviour**
- **2002 *In Vitro* Toxicity Testing**
- **2009 Biomarkers**
- **2018 Consumer Reported Outcome Measures Consortium**
- **2019** 21st Century Toxicology for Next Generation Tobacco and Nicotine Products
- **2020 Smoke Analysis**

Smoke Science

Product Technology

- **2005** Physical Test Methods
- **2006 Cigar Smoking Methods**
- **2008** Tobacco and Tobacco Products Analysis
- **2013** E-Vapour
- **2014** Cigarette Variability
- **2019** Heated Tobacco Products

Thousands of publicly available documents

2021 Conferences

- **Open public sessions**
- **Abstracts can be submitted until 14 May 2021**

www.coresta.org

Relevant Sub Groups

❖ Product Technology:

➢ TTPA – Tobacco and Tobacco Product Analysis

- Objectives
  - To propose and maintain CORESTA Recommended Methods (CRMs) and related documents for the analysis of tobacco and unburned tobacco products.
  - To organise interlaboratory testing related to Objective 1.
  - To organise the manufacture of and maintain smokeless tobacco reference products.

❖ CORESTA Recommended Methods Relevant to Cigar Tobacco:

Constituent	CRM
Water	No. 56 - Determination of Water in Tobacco and Tobacco Products by Karl Fischer Method
	No. 57 - Determination of Water in Tobacco and Tobacco Products by Gas Chromatographic Analysis
Nicotine	No. 62 - Determination of Nicotine in Tobacco and Tobacco Products by Gas Chromatographic Analysis
	No. 87 - Determination of Nicotine in Tobacco Products by GC-MS
pH	No. 69 - Determination of pH in Tobacco and Tobacco Products
TSNAs	No. 72 - Determination of Tobacco Specific Nitrosamines in Tobacco and Tobacco Products by LC-MS/MS
Moisture (OV)	No. 76 - Determination of Moisture Content (Oven Volatiles) of Tobacco and Tobacco Products
Ammonia	No. 79 - Determination of Ammonia in Tobacco and Tobacco Products by Ion Chromatographic Analysis
B[a]P	No. 82 - Determination of Benzo[a]pyrene in Tobacco Products by GC-MS
Water Activity	No. 88 - Determination of Water Activity of Tobacco and Tobacco Products
Expanded list of PAHs	No. 91 - Determination of 15 PAHs in Tobacco and Tobacco Products by GC-MS/MS or GC-MS
Metals	No. 93 - Determination of Selected Metals in Tobacco Products by ICP-MS

Relevant Sub Groups

- **Product Technology:**
  - **CSM – Cigar Smoking Methods**
    - Objectives
    - To develop and update CORESTA Recommended Methods by investigating the technical problems associated with the mechanical smoking of cigars.
    - To conduct periodical collaborative studies in order to improve repeatability and reproducibility in different cigar sizes and types.
    - To establish confidence intervals for the smoke yields of all different cigar sizes.

Cigar Smoking Methods

❖ CORESTA Recommended Methods Relevant to Cigars :

CRM
No. 68 - Determination of Carbon Monoxide in the Mainstream Smoke of Cigars by Non-Dispersive Infrared Analysis
No. 67 - Determination of Water in the Mainstream Smoke of Cigars by Gas Chromatographic Analysis
No. 66 - Determination of Nicotine in the Mainstream Smoke of Cigars by Gas Chromatographic Analysis
No. 65 - Determination of Total and Nicotine-Free Dry Particulate Matter using a Routine Analytical Cigar-Smoking Machine – Determination of Total Particulate Matter and Preparation for Water and Nicotine Measurements
No. 69 - Determination of pH in Tobacco and Tobacco Products
No. 46 - Atmosphere for Conditioning and Testing Cigars of all Sizes and Shapes
No. 64 - Routine Analytical Cigar-Smoking Machine - Specifications, Definitions and Standard Conditions
No. 47 - Cigars - Sampling

➢ **These methods are however not directly applicable to Premium Cigars**

Cigar Smoking Methods

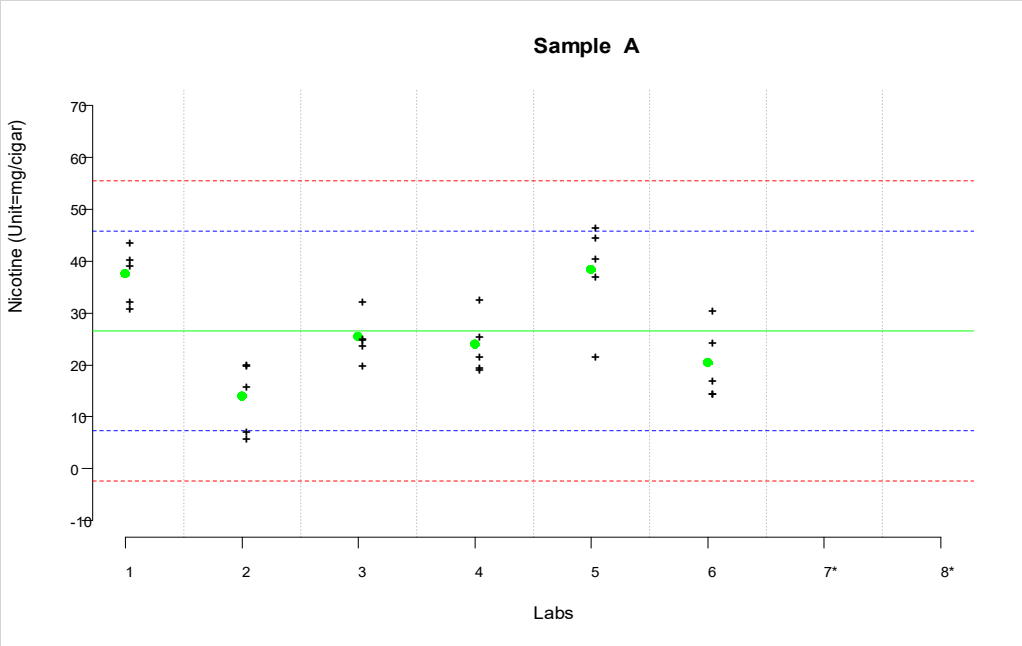
- **New Work Item 148: Smoking Method for Hand-Made Cigars**
  - The purpose of this work item is to identify and resolve technical limitations and challenges within smoke collection experienced with handmade long filler cigars.
  - Status: A technical guide has been developed and a collaborative study conducted.
  - IMPORTANT: Analytical smoking results DO NOT provide an estimate of human exposure during smoking.

Smoking of Hand-Made Long filler cigars

❖ Collaborative Study

Collaborative Study – Example of Results

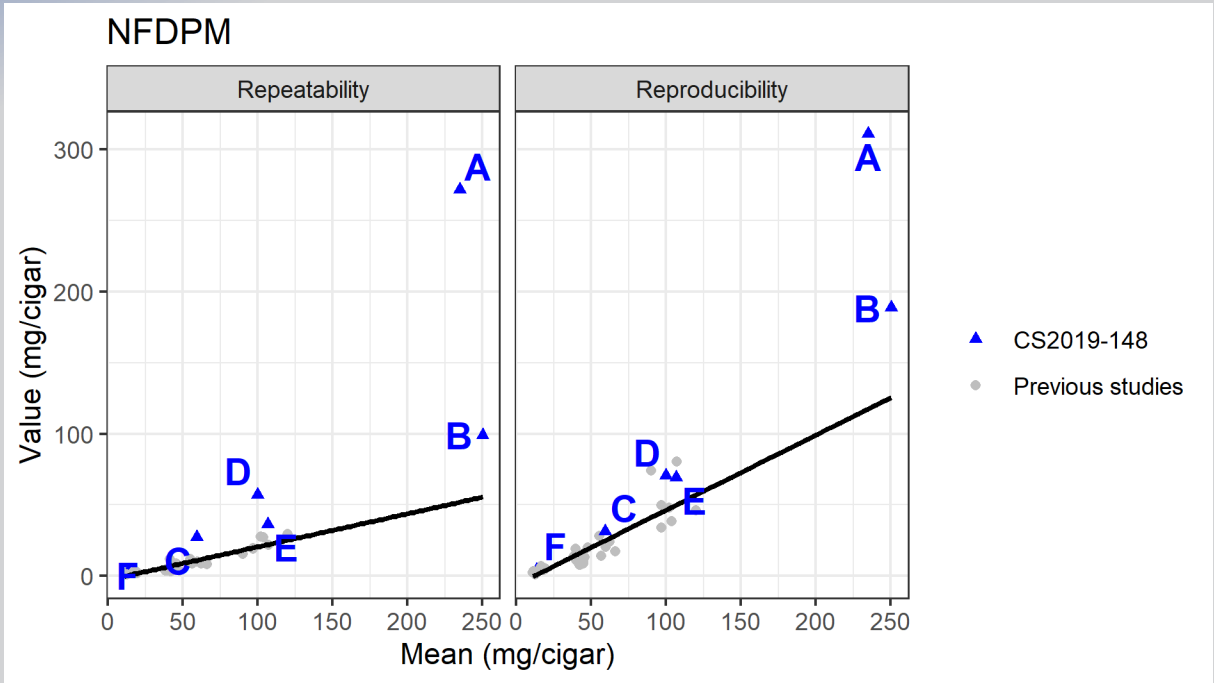
❖ Collaborative Study – Sample A, Nicotine in smoke, 6 laboratories



Collaborative Study – Results – r&R

- **The coefficients of variation of the repeatability CVr (r expressed as a percentage of the overall mean) are in the range:**
  - From 54.2 % to 80.3 % for nicotine
  - From 34.2 % to 115.7 % for NFDPM (Tar)
  - From 29.4 % to 59.4 % for CO
- **The coefficients of variation of the reproducibility CVR (R expressed as a percentage of the overall mean) are in the range:**
  - From 56.5 % to 121.1 % for nicotine
  - From 52.4 % to 132.4 % for NFDPM
  - From 41.4 % to 68.0 % for CO.

❖ r&R are significantly above what is seen for machine-made cigars



Collaborative Study – Comments and Conclusion

- …This study cannot explain the factors driving the variability from cigar to cigar, but this inherent variability of hand-made cigars makes it impossible to discriminate the smoke results of two different cigars unless they are considerably different in weight, probably by a factor of 2.

- Implication: Smoke analysis has significant limitation and challenges when attempting to use results as a comparative tool.

Research published at CORESTA conferences

- **Many years of scientific presentations are available on CORESTA.org**
  - **154 abstracts contain the term « Cigar »**
    - Most are concerned with machine made cigars, but many studies related to cigar tobacco are available.
  - **Only 2 unique abstracts contain the terms « Premium AND Cigar » or « Hand-made AND Cigar »**

49th TWC, Tob. Work. Conf., 2020, abstr. 11

Early experiences with Connecticut broadleaf cigar wrapper tobacco in Kentucky and Tennessee
BAILEY A.; RODGERS C.; KEENEY A.; WITCHER V.
University of Kentucky, Princeton, KY USA

Examples of Research published at CORESTA.org

Early experiences with Connecticut broadleaf cigar wrapper tobacco in Kentucky and Tennessee

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49th TWC, Tob. Work. Conf., 2020, abstr. 11

Simulated curing and fermentation of green cigar binder tobacco by chemical oxidation

ZUCKER M.; BRYAN W.H.

Department of Plant Pathology and Botany, The Connecticut Agricultural Experiment Station, New Haven, Connecticut USA

Tob. Sci., 1957, 1-27, p. 114-117, ISSN.0082-4523

Examples of Research published at CORESTA.org

Handmade premium cigars smoke emissions - limitations related to TNCO determination variability

TEILLET B.(1); SCHULZ C.(2); COLARD S.(1)

(1) SEITA-Imperial Tobacco Limited, Fleury-les-Aubrais, France; (2) Reemtsma Cigarettenfabriken GmbH (an Imperial Brands PLC Company), Hamburg, Germany

CORESTA Meeting, Smoke Science/Product Technology, 2017, Kitzbühel, STPOST 29 (also presented at TSRC 2017)

Summary

- CORESTA is a non-profit scientific organisation striving to be recognised as an authoritative source of publically available, credible science and best practices related to tobacco and its derived products
- CORESTA study groups have developed and published many recommended methods relevant for testing of cigar tobacco
- Work related to analytical smoking of premium hand-made cigars have shown significant variability in the results, limiting the possibilities for using smoke yield to discriminate between different products
- Scientific work related to cigars are available on CORESTA.org, however only very limited studies have been conducted specifically on premium cigar

Questions

THANK YOU